DERWENT-ACC-NO: 2001-421887

DERWENT-WEEK: 200145

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TITLE: Sensorless self-excitation resonance type electromagnetic oscillation apparatus has multiplier whose output controls invertor that supplies electricity to electromagnet for suction force generation

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PRIORITY-DATA: 1999JP-0323322 (November 12, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 2001137778 A	May 22, 2001	N/A	006	B06B 001/04

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP2001137778A	N/A	1999JP-0323322	November 12, 1999

INT-CL (IPC): B06B001/04, B65G027/32 , G05D019/02

ABSTRACTED-PUB-NO: JP2001137778A

BASIC-ABSTRACT:

NOVELTY - The sensors detect voltage and current signals of an invertor (21), which are input to displacement calculation unit (5). The computed displacement signal is input to velocity phase calculator (12) and conveying velocity calculator (9). The output of conveying velocity calculator is subtracted from conveying amount output from circuit (23), to obtain error signal for PID control. The PID controlled signal is input to square root calculator (17) whose output is multiplied with output of velocity

phase calculator, to control invertor that supplies electricity to electromagnet (1) for suction force generation.

DETAILED DESCRIPTION - The sensors detect the voltage and current signals, respectively of an invertor which supplies electricity to the coil of electromagnet (1) that excites vibration subjective object. The absolute values of sensed signals are calculated and divided by a divider (19) in displacement calculation unit (5) that calculates the displacement of vibration subjective object. The bandpass filter (8) chooses a preset band, from displacement information output from divider, for obtaining amplitude of vibration. The obtained amplitude and reference values are compared by a comparator (13). The **output of comparator is integrated** to obtain a triangular wave which is shaped to sine wave of fixed **amplitude** and input to multiplier (18). The phase of velocity of vibration is calculated. The differentiated amplitude of vibration and absolute value of differentiated amplitude are calculated. The absolute value is subtracted from the conveying amount output from the conveying amount command circuit (23) and the difference is input to the PID controller as error. The PID of error is calculated and square root of PID controller output is calculated by square root calculation unit (17) whose output is multiplied with generated sine wave. The output of multiplier controls the PWM invertor.

USE - E.g. resonance type electromagnetic shakers for conveying particles.

ADVANTAGE - Enables stable, efficient and rapid excitation of electromagnet.

DESCRIPTION OF DRAWING(S) - The figure shows the block diagram of sensorless self-excitation resonance type electromagnetic oscillation apparatus. (Drawing includes non-English language text).

Electromagnet 1

Displacement calculation unit 5

Bandpass filter 8

Conveying velocity calculator 9

Velocity phase calculator 12

Comparator 13

Square root calculator 17

Multiplier 18

Divider 19

Invertor 21

Circuit 23

CHOSEN-DRAWING: Dwg.1/12

TITLE-TERMS: SELF EXCITATION RESONANCE TYPE ELECTROMAGNET OSCILLATING APPARATUS MULTIPLIER OUTPUT CONTROL SUPPLY ELECTRIC ELECTROMAGNET SUCTION FORCE GENERATE

DERWENT-CLASS: P43 Q35 T06

EPI-CODES: T06-B12;

SECONDARY-ACC-NO:
Non-CPI Secondary Accession Numbers: N2001-312704